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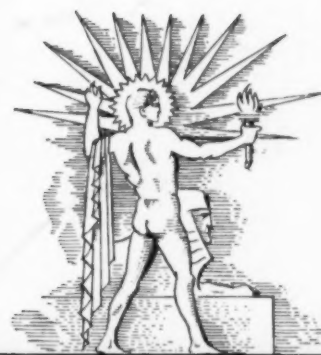
SCIENCE NEWS LETTER

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MAY 6 - 1940

DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



May 4, 1940

Floating Design

See Page 280

A SCIENCE SERVICE PUBLICATION

Do You Know?

To fight spread of malaria in China, the American Red Cross is shipping a million quinine sulphate tablets.

Growing *Easter lily* bulbs in the South and storing the bulbs in summer for a short artificial "winter," florists can now sell lilies in autumn.

Sluggings in holdups caused over half of the jaw fracture cases admitted to the U. S. Veterans' Hospital at Hines, Illinois, in the past seven and one-half years, a staff physician reports.

The idea that factory *ice-cream* is less cold than home-made ice-cream is probably due to air bubbles in factory ice-cream, says a dairy scientist: the bubbles serve as insulators, keeping the taster from feeling the cold sensation so quickly.

Why some automobile parts never *squeak* is explained in photographing colors reflected from an oil film: when a minutely thin continuous flow is formed on the surface of the metal there is no squeak, and the photographic studies may aid in finding oils best suited for lubrication where extreme pressures exist.

Says William C. Hayes, in the Bulletin of the Metropolitan Museum of Art: "The Egyptian artist reached his peak, not when struggling with some huge, conventional project—a royal tomb, a great temple, a colossal statue—but when turning out small and preferably frivolous objects, destined for no more serious end than to delight and amuse some pretty girl in the pharaoh's harem."

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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PHYSIOLOGY

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PSYCHOLOGY

Are there personal differences in pain sensitivity? p. 280.

What is the basis of the "phantom limb" illusion? p. 281.

A New York agricultural experiment station is evolving a pure *maple jelly* as a maple food product.

A Connecticut man runs a "hospital" for *ailing radios*, staffed with "diagnosticians and surgeons," and replete with hospital atmosphere.

First man to have climbed all *mountain* peaks in Western United States—there are more than 60 of them—is Carl Melzer, says *Explorers Journal*.

For want of *coal* to work Lapland iron ore, Sweden has been accustomed to export the ore, but steps toward a local industry have been in progress.

A commercial process for extracting vitamin C from *roses* was recently reported from Sweden.

Although *coffee* was drunk during the Middle Ages, not until 1625 was sugar popularly used in it, and milk not until 1660.

A chemical derived from castor oil is being used, in combination with a small amount of pyrethrum, as a new *fly spray*.

Practically all wild animals except common rabbits will *bite* a man when first handled, says a writer in *Natural History Magazine*.

SCIENCE NEWS LETTER

Vol. 37 MAY 4, 1940 No. 18

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 2101 Constitution Avenue, Washington, D. C. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

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Cable address: Scienserve, Washington.

Entered as second class matter at the post-

office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER at \$3 a year.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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PHYSICS

New Electron Microscope May Some Day "See" Atoms

**New Model Achieves Magnifications Up to 30,000
Diameters, Instead of 5,000 Hitherto Possible**

A MICROSCOPE that "sees" by electrons, or particles of electricity, instead of light, and that can reach so far into the depths of matter that eventually it is expected that it will be possible to "see" atoms themselves was demonstrated to members of the American Philosophical Society by Dr. V. K. Zworykin of RCA's Electronic Research Laboratories.

This latest electron microscope achieves magnifications of 25,000 to 30,000, instead of about 5,000, maximum with even ultraviolet light optical microscopes.

First research application of the perfected electron microscope is expected to be in biological fields. It is considered possible that the new microscope may help solve the problem of the nature of the viruses that cause cer-

tain unconquered diseases. Already in preliminary work unidentified particles evidently associated with disease germs, but hitherto unsuspected, have been seen. Extremely fine particles in materials of industrial importance, such as rubber latex, are shown to have shapes different from those they were believed to have.

Science News Letter, May 4, 1940

GENERAL SCIENCE

Franklin Medals Awarded To Compton and Baekeland

FRANKLIN medals, highest awards of the Franklin Institute, will be presented on May 15 to Dr. Arthur H. Compton of the University of Chicago for his researches on X-rays and to Dr. Leo H. Baekeland for his invention of the synthetic plastic, Bakelite.

Other awards announced are: Elliott Cresson medals to Dr. Frederick M. Becket, president, Union Carbide and Carbon Research Laboratories, for his researches on alloys, and to Dr. Robert R. Williams, chemical director, Bell Telephone Laboratories, for his researches on vitamin B₁.

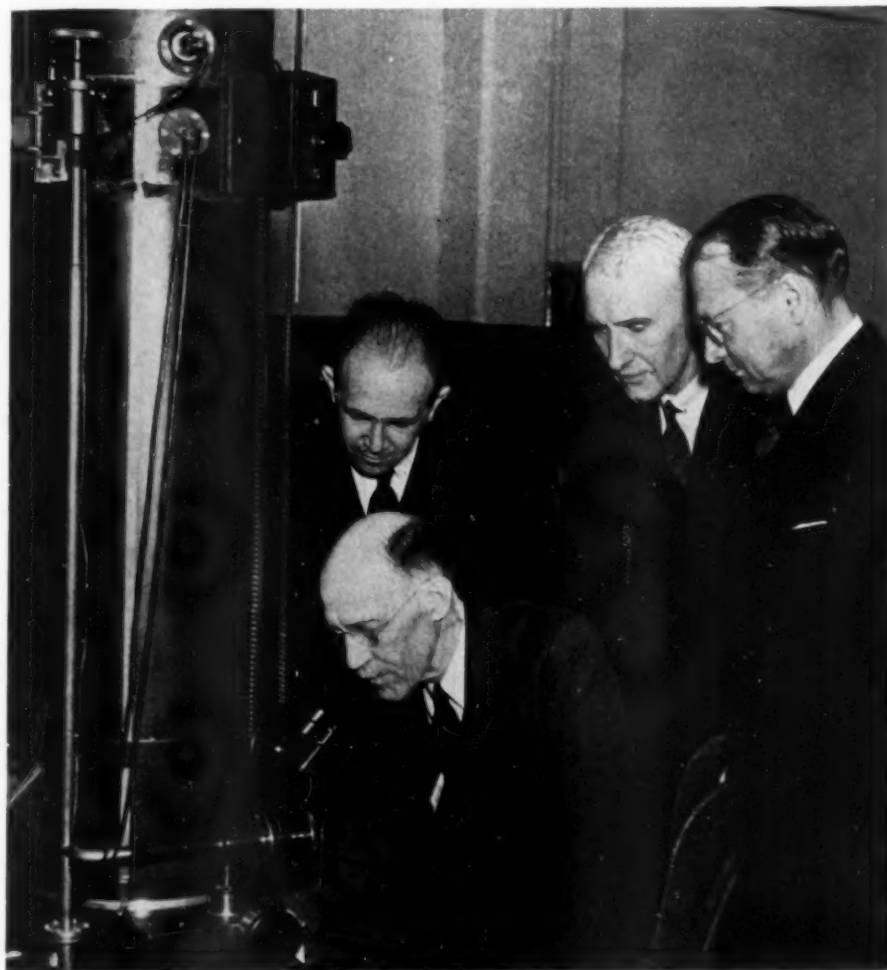
The Louis E. Levy medal jointly to Dr. Charles Rosenblum of Princeton and Dr. John R. Flagg of the University of Rochester, for their researches on artificial radioactive indicators.

The George R. Henderson medal to William E. Woodard, Lima Locomotive Works, for steam locomotive design.

The John Price Wetherill medals to Laurens Hammond of Chicago, for the Hammond Organ, and to Edward E. Kleinschmidt, Highland Park, Ill., and Howard L. Krum, Beverley Hills, Calif., for the development for the teletypewriter.

The Edward Longstreth medals to Leopold Godowsky, Jr., and Leopold D. Mannes of Eastman Kodak Company, for development of Kodachrome film, to Games Slayter of Owens-Corning Fiberglas Corp., for development of spun and blown glass filaments, to Richard L. Templin of the Aluminum Company of America for an automatic deformation recorder, to Dr. Maxwell M. Upson, Raymond Concrete Pile Company, for contributions to foundation engineering and construction. Certificate of merit to George H. Ernsbarger of Honolulu and Frank L. McCarty of Ogden, Utah, for development of a loading device.

Science News Letter, May 4, 1940



MAY "SEE" ATOM

This latest electron microscope achieves magnifications of 25,000 to 30,000 instead of about 5,000, maximum with even ultraviolet light. Seated looking at the instrument is Dr. Ross Harrison, Yale University. Standing are: Dr. Ladislaus Marton (left) who with Dr. V. K. Zworykin, RCA Research Laboratories, developed the microscope, and (center) Dr. A. V. Hill, of Cambridge, England.

For many years heart disease has been the leading cause of death among physicians in the United States.

GENERAL SCIENCE

Germ-Killers in Soil Promise Conquest of all Bacteria

Substance Which Can Pass Through Bacterial Filter Destroys Germs of Gram Positive and Negative Groups

CONQUEST of the entire world of disease-producing germs seems possible as a result of the discovery, reported to the National Academy of Sciences, of germs in garden and field soil which destroy disease germs of the gram-negative group. The discovery was made by Drs. Selman A. Waksman and H. Boyd Woodruff, of the New Jersey Agricultural Experiment Station.

Disease germs of the gram-positive group can also be destroyed by chemicals extracted from germs found in soil, Dr. Rene Dubos, a former student of Dr. Waksman, and now at the Rockefeller Institute for Medical Research, has just reported.

Since all disease germs belong to either one or the other of these two groups, the discovery announced seems to herald the rapid approach of man's triumph over germ-caused disease, even if many years must yet be spent in searching for methods of applying these two discoveries in practical germ-fighting.

Germs of typhoid fever, dysentery and cholera, among others, belong to the group of gram-negative germs against which Drs. Waksman and Woodruff have found natural enemies in other micro-organisms from soil. Pneumonia and diphtheria germs and the staphylococci belong to the gram-positive group for which Dr. Dubos has discovered in soil germs death-dealing chemicals.

Two specific bacteria and several germs of the fungus type were isolated from the soil by the New Jersey investigators and shown to be able to antagonize—that is, check the growth and destroy—one or more of the gram-negative germs. The soil germs are quite specific in their action. The one that checks the growth of the colon bacillus, for example, is quite different from the germ that checks the growth of the undulant fever germ.

The substance in the soil germs which destroy the disease germs can pass through a bacterial filter, is absorbed by charcoal, is soluble in ether and is fairly stable when heated, Drs. Waksman and Woodruff have discovered.

Drs. Waksman and Woodruff stated that when disease-producing bacteria "are

introduced into the soil, as in the excreta of patients suffering from various diseases, as well as in the dead bodies of men and animals, they are rapidly destroyed by corresponding antagonists," meaning the soil germs they found.

"As a result of this," they stated, "the soil can hardly be considered as a source of epidemics and as a carrier of the more common infectious diseases."

Science News Letter, May 4, 1940

Feed on Non-Living Matter

A NEW step forward in the exploration of the baffling but challenging border zone that may lie between the living and the non-living was announced before the Academy meeting, when Dr. L. O. Kunkel of the Rockefeller Institute for Medical Research at Princeton, N. J., told how he had succeeded in isolating and cultivating a new group of filter-passing organisms that do not require living tissues on which to feed.

Viruses are either the simplest and smallest of living things or (probably) the largest and most complex of non-living molecules, able, among other life-like performances, to perpetuate their own kind. All species hitherto known require living tissues for their sustenance; they are parasites, causing such plant diseases as mosaic and curly-top, and animal diseases like hog cholera, hoof and mouth disease, smallpox and yellow fever.

Scientists have been intrigued by the possibility that viruses may represent the most primitive form of life on earth; but obviously so long as they required the presence of much higher types of organisms for their food, they could not be imagined as pioneering life on a lifeless planet. Discovery of a group of virus-like entities that can get along without living hosts is a step away from this dependency.

To be sure, the divorce between filter-passing organisms and hosts in the group described by Dr. Kunkel is not a very drastic one. The new organisms were discovered in tomato and tobacco plants afflicted with mosaic disease, and in a few apparently healthy plants. How-

ever, the facts remain that they can be cultivated in glass dishes and that they will feed and grow on a diet of sterile, non-living plant juice.

As described by Dr. Kunkel they produce translucent colonies that resemble spheroid crystals. They are composed typically of radiating needle-shaped or plate-shaped structures that may be dissolved in dilute alkali solutions. Films composed of such dissolved colonies, suitably stained, show large numbers of tiny spherical particles.

"The particles occur singly or in chains of twos, threes and fours," Dr. Kunkel reported. "The chains suggest that multiplication is by division and that the particles are minute cells."

Science News Letter, May 4, 1940

Radiation Varies with Spots

FLUCTUATIONS in the amounts of light and heat given off by the sun correspond closely to fluctuations in the areas of the spots that freckle the sun's face, Academicians were told by Dr. Henryk Arctowski, eminent Polish scientist now at the Smithsonian Institution.

Dr. Arctowski made a careful comparison of day-by-day records of both solar radiation and spot areas, covering a period of five years. While the ups and downs of the two curves he drafted run closely parallel they do not exactly coincide. There was a constant tendency for both maxima and minima in the solar constant curve to run a little in advance of those for the sunspot areas.

Science News Letter, May 4, 1940

Moon's Apparent Size

THE GIANT size of the full moon as it comes above the horizon is proverbial in song and story, but two Harvard scientists showed that the moon's apparent size is only an illusion based on how you look at it.

Drs. Edwin G. Boring and Alfred H. Holway told the academicians that if one lies on his back on the ground and looks at the moon when it is on the meridian (at culmination, or greatest altitude in the sky) it will have a much larger apparent diameter than when on the horizon. This is just the reverse of the moon's ordinary appearance, where it seems largest on the horizon and smallest when high in the sky.

The illusion of the moon's size, the Harvard scientists declared, seems to be linked with the movement of the eyes.

"For a supine observer," they stated, "the horizon moon is smallest and the moon in elevation (*Turn to page 285*)

National Academy of Sciences 1940



ACADEMICIANS GATHER

Dr. G. Failla, Memorial Hospital, smokes and chats with Dr. Robley D. Evans, Massachusetts Institute of Technology (top left). Top right: Dr. E. O. Hulburt, Naval Research Laboratory with Dr. T. Takamine, Institute for Physical and Chemical Research, Tokyo, and Dr. Fred L. Mohler, National Bureau of Standards. Center: Abnormalities in corn and orange on exhibit. Right center: Prof. Edward Kasner, Columbia University. Lower left: Dr. Bernard O. Dodge, New York Botanical Garden, Dr. Albert F. Blakeslee, Carnegie Institution of Washington, Dr. D. R. Jones, Connecticut Agricultural Experiment Station. Lower Right: Dr. Karl T. Compton, Massachusetts Institute of Technology, Dr. E. O. Lawrence, University of California, and Dr. Alfred L. Loomis, Loomis Laboratory.



GENERAL SCIENCE

Science Most International Of All Human Activities

Secretary General, Eighth American Scientific Congress,
Points to Spirit of Fraternity Among Delegates

By DR. ALEXANDER WETMORE,
Secretary General of Congress

THE EIGHTH American Scientific Congress offers an opportunity for extending and consolidating the underlying sense of fundamental unity and friendship common to all the American Republics.

Science today dominates the world. The radio, telegraph, and telephone provide instant communication between all the peoples of the Americas. The airplane and the automobile have revolutionized transportation. Modern industry employing millions of men has been built up through the coordination of scientific discoveries. Medical science saves millions of lives annually. And now we are beginning to realize that an application of the humanistic sciences will serve to make life more satisfying, more enjoyable, for everyone.

The Congress will be opened by President Roosevelt on the evening of Friday, May tenth. During the week following, there will be discussions of all phases of science which, for convenience, will be divided into eleven sections. The meetings will be open to all interested.

But the program will by no means be confined to scientific meetings. We wish to show our guests from Latin America as much of our country and of our scientific activities as possible in the short time that we will be honored by their presence.

The most democratic and the most truly international of all forms of human activity is science. Every nation and every race has contributed to its advancement, and within the nations all the various groups into which the population is divided have brought their share. All peoples find here a common meeting ground.

It is in this spirit of underlying fraternity, and of consciousness of the fundamental unity of the efforts of all peoples and of all groups toward a common goal of general betterment that the delegates of the twenty-one American Republics will assemble in Washington.

Science News Letter, May 4, 1940

LA REUNIÓN del VIII Congreso Científico Americano ofrecerá una magnífica oportunidad para ensanchar y consolidar aun más los sentimientos fundamentales de unión y de amistad que animan a todas las Repúblicas americanas.

En la actualidad, la ciencia ejerce dominio sobre el mundo. La radio, el telégrafo, y el teléfono proporcionan comunicación instantánea entre todos los pueblos de las Américas. El aeroplano y el automóvil han revolucionado los transportes. La industria moderna que proporciona ocupación a millones de personas ha alcanzado su actual desarrollo gracias a la coordinación de los descubrimientos científicos. La ciencia médica salva anualmente la vida de millones de personas. Hoy día principiamos ya a darnos cuenta de que con el aprovechamiento de las ciencias humanistas lograremos hacer que la vida sea más satisfactoria y más agradable.

El Congreso lo inaugurará el Presidente Roosevelt la noche del viernes 10 de mayo. Durante la semana siguiente se llevarán a discusión todas las ramas de los conocimientos científicos, los que, para mayor conveniencia, serán divididos en once secciones. Las reuniones serán públicas para todos aquellos que tengan interés en asuntos científicos.

El programa no se limitará, sin embargo, a meras reuniones científicas. Es nuestro deseo mostrar a nuestros huéspedes de la América Latina lo más posible de nuestro país y de nuestras actividades científicas durante el corto espacio de tiempo en que nos honrarán con su presencia.

La ciencia es la forma más democrática y más verdaderamente internacional de todas las actividades humanas. Todas las naciones y todas las razas han contribuido a su desarrollo.

Animados, pues, por este espíritu de confraternidad y conscientes de la unidad fundamental de los esfuerzos de todos los pueblos y de todos los grupos para alcanzar el progreso y el bienestar comunes, los delegados de las veintiuna Repúblicas americanas se reunirán en Washington.

Science News Letter, May 4, 1940

OITAVO Congresso Científico Americano prestes a reunir-se, proporcionará enseño para alargar e consolidar o sentimento latente de unidade e amizade fundamental que é comum a todas as Repúblicas americanas.

O mundo hoje está sob o domínio da ciência. Os meios hodiernos de comunicação como a radiotelefonía, o telegrafo e o telefone colocam em estreito contacto todos os povos das Américas. Em matéria de transporte aí estão os automóveis e os aeroplanos que o vieram revolucionar de uma forma nem sequer imaginada há cinquenta anos atrás. E quanto à indústria moderna, atingiu ao seu estupendo progresso atual graças à coordenação das descobertas científicas, que a habilitam a empregar milhões de operários. Se nos voltarmos ainda para uma outra fase da ciência, vemos que a ciência médica salva milhões de vidas anualmente, e só agora é que começamos a reconhecer que a aplicação das ciências humanísticas servirá para tornar a vida mais tolerável, mais agradável de viver para todos.

O Congresso será inaugurado pelo Presidente Roosevelt na sexta-feira dez de maio, à noite. No correr da semana seguinte, serão debatidas as mais variadas fases da ciência, a para maior facilidade no discutir os diversos assuntos científicos, o programa foi distribuído pelas onze secções em que está dividido o Congresso. As sessões serão públicas podendo a ela assistir toda pessoa que tenha qualquer interesse científico.

Mas o programa não está, de forma alguma, limitado a sessões científicas, pois é desejo da Comissão organizadora do Congresso mostrar aos congressistas latino-americanos que os Estados Unidos vão hospedar, o mais que for possível mostrar do país e de suas atividades no campo das ciências, durante a breve estadia dos delegados visitantes.

A ciência é a mais democrática e a mais genuinamente internacional das formas de atividade humana. Todas as nações como todas as raças têm contribuído a sua parcela para o progresso da ciência, e dentro das próprias nações todos os vários grupos em que a população está dividida têm, igualmente, concorrido com a sua parte para esse mesmo fim.

Imbuídos desse espírito que alicerça a amizade, cóncios da unidade fundamental que norteia os esforços de todos os povos e de todos os grupos para um alvo comum —o do melhoramento geral da humanidade,—é que os delegados das vinte-e-uma Repúblicas americanas virão congregar-se em Washington para tomar parte no Oitavo Congresso Científico Americano.

Science News Letter, May 4, 1940



PREPARATION

Dr. Alexander Wetmore, assistant secretary of the Smithsonian Institution and secretary general of the Eighth American Scientific Congress discussing plans with Dr. Leo S. Rowe, director general of the Pan American Union. They stand in the lovely patio of the Pan American Union where are exhibits of flowers, foliage, and birds of the southern lands.

PAN AMERICAN UNION

Here will gather delegates from twenty-one American Republics to discuss scientific problems of mutual interest.



PHYSIOLOGY

Color-Change Chemistry Studied in Catfish

THE COMMON catfish can change its color like a chameleon, but much more slowly: it requires from one to two days to pass through its range from coal-black to pale greenish yellow. At the meeting of the American Philosophical Society, Prof. G. H. Parker of Harvard University discussed the physiological mechanism of these color changes.

It appears that they are all a matter of glandular reactions, stimulated by light reflected from the fish's background to its eyes or its skin. When light falls upon the skin, its effect is carried to the pituitary gland, which discharges a substance called intermedin. This is carried by the blood to the pigment-cells of the skin, which disperse their pigment and cause the fish to become dark.

When light from a dark surface enters the fish's eye, certain nerve fibers ending in the skin act more or less as glands, secreting a substance which also acts on the pigment-cells, causing darkening. Light reflected from a white surface has an opposite effect, producing a change toward lighter color.

In all, three secretions are involved in the color changes; intermedin, the darkening hormone (probably acetylcholine), and the lightening hormone (apparently adrenalin).

Fatty substances in the body may play an important role as storage reservoirs for some of the chemical compounds that control life processes, Prof. Parker suggested a few days later at the meeting of the National Academy of Sciences. His experiments have shown that when the nerves have been secreting acetylcholine for some time, it accumulates in fatty substances around the pigment cells, causing the darkening effect to persist. Prof. Parker considers it possible that other chemical control compounds are absorbed and stored by fatty substances in the same way.

Science News Letter, May 4, 1940

● RADIO

Dr. Alexander Wetmore, assistant secretary of the Smithsonian Institution, and secretary general of the Eighth American Scientific Congress will describe the Congress as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, May 9, 4:00 p.m., EDT, 3:00 EST, 2:00 CST, 1:00 MST, 12:00 PST.

Listen in on your local station. Listen in each Thursday.

AGRICULTURE

Europe's War Creates American Cheese Problem

AMERICA now has a cheese problem, the result of European war conditions which are interfering with shipments of rennet from such countries as Denmark, Germany, Italy and Poland.

A warning that the United States had better look to American sources of rennet, is sounded by the U. S. Department of Agriculture. Rennets, which are calves' stomachs, are the source of an extract used to curdle milk. The extract is used in making cheddar or American cheese, the leading type of cheese produced in this country.

Rennets can readily be prepared in any country, the Department explains, and no effect on prices or supplies of American cheese is foreseen, for want of imports.

Science News Letter, May 4, 1940

ARCHAEOLOGY

Records on Clay Tablets Match Situations in Bible

ALTHOUGH the life stories of Abraham, Isaac, and Jacob were handed on by word of mouth for a thousand years before the Book of Genesis was written, they provide a true and undistorted picture of social conditions in the Patriarchal Age.

So Dr. Cyrus H. Gordon of the Institute for Advanced Study, Princeton, declares in the quarterly journal, *The Biblical Archaeologist*, citing some of the striking discoveries that scholars have made as they decipher clay tablets unearthed at Nuzi, in Mesopotamia.

Poring over quantities of records in cuneiform writing, preserved since 1500 B. C. in the earth at Nuzi, they find instance after instance in which business deals, customs of marriage and inheritance, and legal arguments parallel Old Testament situations of about 2000 to 1500 B. C. The clay tablets were made by Hurrian people, now identified as some of the long-lost Horites named in the Bible.

Archives from Nuzi show why Abraham's heir at first was a slave adopted as his son, Dr. Gordon explains.

"It was a custom at Nuzi," he states, "for childless people to adopt a son to serve them as long as they lived and to bury and mourn for them when they died. In exchange for these services the adopted son was designated as heir."

When Abraham's own son was born, the inheritance shifted—again in accord-

ance with customs recorded at Nuzi.

Spoken blessings of Bible patriarchs, which were as binding as last wills and testaments, were paralleled at Nuzi. Here, the Bible clarifies Nuzi customs.

It would be natural for nomadic patriarchs, who did not resort to writing, to accept the spoken word as binding, explains Dr. Gordon. But it is strange to learn that Nuzi's Horites, who were so given to recording even trivial transactions, would uphold an oral "blessing" in court.

Science News Letter, May 4, 1940

PSYCHOLOGY

Scientists Measure Heat Causing Pain on Own Skins

THREE scientists submitted themselves to a burning radiation in order to learn more about human pain and reported their results to the Eastern Psychological Association.

The amount of heat that will cause pain remains constant, regardless of the spirits or attitude of the individual, Drs. J. D. Hardy, H. G. Wolff, and H. Goodell, reported to the meeting. Exactly 0.228 (plus or minus .004) gram calories per second per square centimeter is required to evoke pain in three seconds. They made their study for the Russell Sage Institute of Pathology in affiliation with the New York Hospital and Cornell University Medical College.

You feel pain because of nerve pathways, sense structures, and brain receiving mechanisms, entirely separate from those of other senses, they concluded. That the feeling of pain is separate from that of heat, for example, is clearly shown by the fact that acetylsalicylic acid (Aspirin) increases the amount of radiation that is necessary to cause pain, but actually decreases the amount necessary to cause the sensation of heat.

Pain in one part of the body raises the pain threshold, or decreases the sensitivity to pain, in other parts of the body. This finding gives confirmation to the theory that a counter-irritant such as the burning of a mustard plaster may relieve the feeling of pain elsewhere in the body.

The experience of pain probably causes a chemical change in the brain which outlasts the pain itself several hours, these investigators found.

A severe pain of 40 minutes duration preceding the injection of morphine, they observed, will abolish the pain-relieving effect of this drug.

Science News Letter, May 4, 1940

IN SCIENCE

PHYSIOLOGY

New Science Publication Planned for Scandinavia

ALMOST under the menacing muzzles of Nazi guns, a new venture in scientific journalism is being undertaken for the publication of results of physiological research in the four Scandinavian countries. The new journal will be issued from Stockholm under the editorship of Prof. Göran Liljestrand, and will be known as *Acta Physiologica Scandinavica*.

Announcement of the new venture, published in *Science*, (April 19) contains an appeal to English-writing scientists to send manuscripts for publication and to subscribe, "the more so as we must face the probability that it will be officially or unofficially excluded from Germany."

The statement, which was mailed from Copenhagen before the Blitzkrieg over Denmark and Norway, continues:

"We are well aware of the difficulties. Our countries are being impoverished by the war at an appalling rate and are under a constant menace, but we are determined (even our colleagues in Finland) to carry on the scientific work and to do our best to make this new venture a success."

Science News Letter, May 4, 1940

BOTANY

Floating Liverwort Is Study in Design

See Front Cover

NAURAL courses of events, if simply left to themselves, frequently produce patterns and designs of beauty that the cleverest of human artists cannot approach. Such a design, for example, is shown in the cover picture on this issue of THE SCIENCE NEWS LETTER.

It is a photograph of a floating mat of aquatic liverwort, *Ricciocarpus natans*, made by Prof. William Campbell Steere, of the University of Michigan, and used by him as an illustration in a newly published regional bryological flora. But wouldn't it look lovely, simply transferred directly to green silk?

Science News Letter, May 4, 1940

NEW FIELDS

PSYCHOLOGY

You Can be Hungry in Five Different Ways

HUNGER is not one simple pang, Dr. Paul Thomas Young, of the University of Illinois, told the Eastern Psychological Association. There are at least five independently variable hungers: for fat, carbohydrate, protein, salt and water.

If a rat is fed sugar as a reward for running, his activity will gradually decrease as he gets "fed up" with sugar, Dr. Young found. But if wheat is then substituted for the sugar, the rat's activity will increase again. He is hungry for the wheat although well fed on sugar.

Science News Letter, May 4, 1940

PSYCHOLOGY

War Gives Opportunity For "Phantom Limb" Studies

THE WHOLESALÉ maiming of human bodies in the present European conflict is seen by the psychologist as an unfortunate opportunity for study of a curious phenomenon—the "phantom limb."

After the amputation of a leg or an arm (and some 60,000 were cut off in the World War), the patient is likely to suffer from a strong hallucination that the missing limb is there and functioning, moving, itching, or hurting in the usual way, Dr. S. Feldman, of Cornell University, told the Eastern Psychological Association.

The illusion is very strong and clings involuntarily, in one case for as long as 56 years.

The illusion, Dr. Feldman suggests, may be caused, paradoxically, by the very absence of the missing limb, for we are aware of parts of our body only when something goes wrong with them. He thinks that the peculiar experience is something like the feeling one has of a ring of pressure around the head after the hat has been removed. Some movement of the body will initiate the feeling of compensating movement in the missing limb and the phantom returns making its presence keenly felt as does that little man on the stair.

In an experiment described by Dr. Feldman, a phantom fishing rod was created in the fisherman's hand by allowing him to grasp only an amputated rod, a mere handle, and putting a down pull on one end and an up pull on the other. Thus it was shown that perception of the rod extending beyond the hand depends upon the rod's lever action.

The human limb is a balanced system of weights and levers and perception of it depends, Dr. Feldman explained, upon the body's adjustment to the limb's lever action.

Whenever we move, he said, a readjustment takes place involving all the limbs. So long as that proceeds without a hitch, we remain unaware of the process. But when an arm or a leg has been amputated, almost every movement attempted entails a very serious hitch in the readjustment.

Science News Letter, May 4, 1940

PHYSICS

For Best Mayonnaise Put Oil in Underneath

THE best method for the preparation of concentrated oil-in-water emulsions (mayonnaise to you) has been determined by Dr. Irene Sanborn Hall and Mrs. Elsie Halstrom Dawson working at the University of California (*Industrial and Engineering Chemistry*, March).

The trick is to put in the oil beneath the surface of the liquids being whipped together, not by pouring it or dropping it from above. When an air film adheres to the oil the stability and homogeneity of the mayonnaise is less than it is when the film is absent. Here is the recommended method of preparation: (recipe to you) To one large egg yolk which has been thoroughly beaten for about half a minute, approximately 2 large tablespoons of salad oil are added by injecting beneath the surface of the egg yolk. This oil must be added very slowly and the electric beater should be used at its slowest speed. The mixture will be very stiff and more oil should not be added at this time else the emulsion will break. To this mixture $2\frac{1}{3}$ tablespoons vinegar and approximately 3 teaspoons of mixed spices are added. The emulsion is immediately thinned by these but does not break. The rest of the salad oil is then added at a faster rate with the electric beater operating a speed 3. The quantity of oil added will depend upon the consistency desired.

Science News Letter, May 4, 1940

PHYSICS

New Coated Lenses Better Than Costlier Old Ones

MODERATELY priced binoculars, thanks to a new coating for their lenses, can be made as effective as more expensive instruments of the past with untreated lenses on account of a development by Dr. John Strong of the California Institute of Technology, reported by W. C. Miller of Paramount Pictures to the Society of Motion Picture Engineers at Atlantic City.

Paradoxically, by coating lenses with a transparent film of the order of a millionth of an inch thick about 85% of the surface reflection is eliminated and the light no longer reflected goes through the lenses and makes the vision more effective. This reflection-suppressing trick is being used wherever optical glass lenses are being used, in microscopes, cameras, motion picture cameras, motion picture projectors, etc. Motion picture projector lenses treated with the new film show a 50% increase in screen brightness, it is reported.

Science News Letter, May 4, 1940

CHEMISTRY

Liquid Wood Promises New Plastic Industries

LIQUID wood, produced by the same kind of methods by which Germany is now creating much of its gasoline from coal, is the newest product of Canadian chemical science. Water-white liquids are obtained which chemists believe will provide the raw materials for a future synthetic organic chemical industry. Prof. Harold Hibbert of McGill University described the new way of processing wood at the meeting of the American Chemical Society.

One of the new liquid woods, Prof. Hibbert explained, "is so closely related to the raw material from which the synthetic fiber nylon is made that it should readily prove possible to obtain from it a new variety of this interesting fiber, the raw material being wood instead of coal."

Liquid woods are made under high pressure by adding hydrogen to the molecules. A similar method can be used with coal to make liquid petroleum in a way first discovered by the German Nobelist, Dr. Friedrich Bergius.

Prof. Hibbert sees in his new liquid wood a way to utilize the tremendous masses of waste wood of the world.

Science News Letter, May 4, 1940

PHYSICS

Sunshine and Atoms May Be Power Sources of the Future

Goal of Scientists Now Is To Tap Atomic Power And To Learn How Sun Energy Can Be Stored

By WATSON DAVIS

POWER from within the atom, or from the sunshine, may revolutionize the world in which we live. If scientists can wrest practically from the atom its internal energy or solve the secret of how the green leaf stores up the energy of the sun's rays, there may come a superpower age when usable energy will be almost as free as the air we breathe and the water we drink.

As we rely upon oil and gas, good for at least tens of years in the future, and coal, good for at least hundreds of years in the future, research is being conducted quietly upon the possibility of tapping new power sources before oil and coal become scarcer or are exhausted.

Should fortunately fruitful research give us access to the internal energy of the atom, a very efficient way of storing the sun's vast radiant energy, or some other low cost power source, there might be economic repercussions of major consequence.

The sun is fundamentally almost our sole source of available energy. Heat and electric power is derived from the sun whether it is generated hydro-electrically or by use of coal and oil. All food is manufactured by green plants through the use of sunshine. For ages men have fought for literally their places in the sun. The war in Europe is in part a struggle for the fossil sunshine of past ages, the oil and coal necessary to modern industry and living.

The problem of solar energy is a very large one. According to Dr. O. L. Inman, director of the C. F. Kettering Foundation for the Study of Chlorophyll and Photosynthesis at Antioch College, Yellow Springs, Ohio, the best estimates are that the energy reaching the earth from solar radiation each year is equivalent to that received from burning four hundred sextillion (400,000,000,000,000,000,000,000) tons of anthracite coal. From this source mankind could draw plenty of available energy for all its needs.

The green plant is the principal con-

verter of solar energy into useful material for mankind. The process by which it does this is called photosynthesis although just how the plant does this is still unknown. Obviously, this is one of the major problems of our civilization.

Yet, a rough estimate by Dr. Inman of the amount of money budgeted in 1940 for this work in the United States is only about \$250,000 to \$300,000.

Dr. Inman sees two ways of approaching this problem so important to the long-time provision of power to our civilization.

First, we could learn more about plant growth and grow several hundred times the amount of vegetation we now grow, transforming much of this into more condensed charcoal from which gas, oil, etc., may be made.

Second, through fundamental research we could solve the mechanism of how to fix with the tools we now have available the carbon of carbon dioxide and the hydrogen of water into chemical compounds similar to methane or marsh gas and gasoline; or, by the addition of oxygen, to get sugar, woods, or fats; and, by the further addition of nitrogen, to get proteins and so on to thousands of possible compounds or molecules with energy stores ready for use.

When man solves the problem of photosynthesis and sets up his own method of storing radiant energy from the sun, it may very well not be an exact duplicate of the method used by the green plant. It may even be more efficient.

Man has been taking for granted that he can in some way keep on depending on capital stores of coal, oil and gas for energy. Dr. Inman feels that the solution of the problem of photosynthesis in a practical way is a long-time research program. If it is not started sufficiently early on a large scale, mankind may find that it was too late beginning the research. Serious shortage of power and energy supplies may be visited upon the earth by our failure to begin research even though we knew the job had to be done.

Within the atom there are as yet untapped stores of energy which if released would furnish almost unlimited amounts of power, enough to take care of all the energy needs of mankind.

A mere two years ago the probability of the release of atomic power of any kind seemed fantastic. Early in 1939, the splitting of the heavy chemical element uranium with the release of an enormous amount of interatomic energy was demonstrated. Laboratories throughout the world that had "atom smashing" apparatus have been exploring as rapidly as possible with relatively limited resources this very exciting possibility.

The best opinion at the present time seems to be that while it may be possible to obtain energy from uranium on a scale of commercial importance for special uses, this type of reaction if made practical will at best tap only an infinitesimal fraction of the total atomic energy around us.

The hope of tapping large amounts of atomic energy seems to lie in the possibility of discovering in the future a mechanism for atomic annihilation, in the opinion of Dr. M. A. Tuve of the Carnegie Institution of Washington's Department of Terrestrial Magnetism, one of the leading investigators in this field.

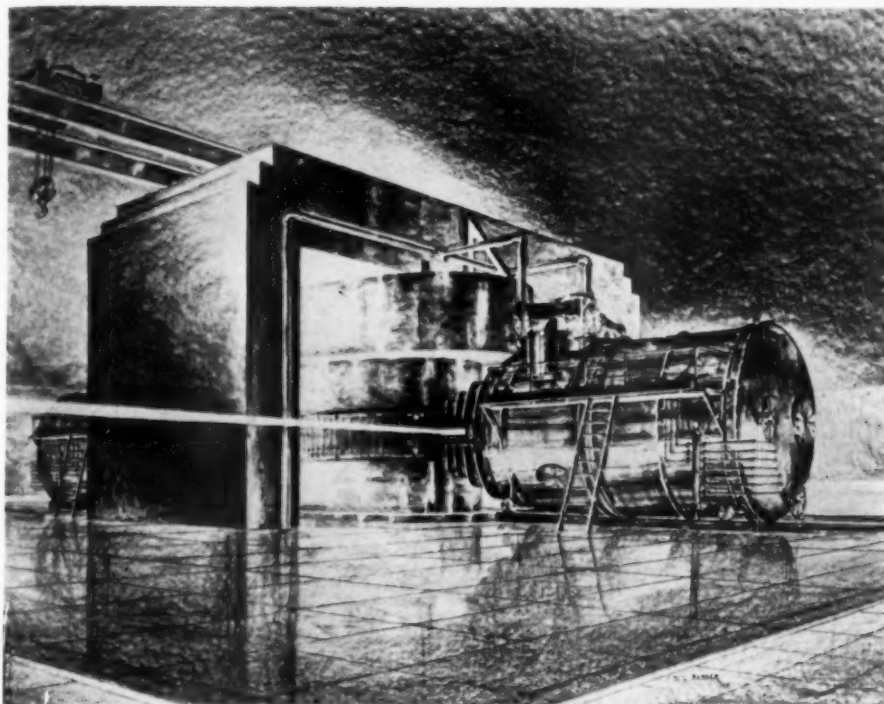
Leaders in research were optimistic when they were questioned about atomic energy.

Dr. William D. Coolidge, director of research laboratories of the General Electric Company, states:

"It has been shown that in the case of the element uranium an enormous amount of interatomic energy may be set free, so much, in fact, that if further research shows how the process once started may be made self-propagating, we may be able to get as much energy from a pound of uranium as from millions of pounds of coal. This might prove to be a cheaper source of power than any other. Even if it were more expensive it might be revolutionary in those applications where weight and bulk are all important. It also seems possible that further nuclear research may show how the interatomic energy of some of the more common elements may be economically set free."

Dr. Lee de Forest, famous engineer, whose inventions have been so important in radio, motion pictures, etc., states:

"The cyclotron as developed by Prof. E. O. Lawrence, of the University of California, has already justified man's hope that eventually he will be able to derive by elemental fission cheap, universally obtainable power in unlimited



MAY RELEASE ATOMIC POWER

This is the artist's drawing of how the projected new 4,900-ton cyclotron will look when it is built for the University of California. The Rockefeller Foundation recently made this possible by a gift of \$1,150,000.

quantities. Our oil and coal resources must otherwise be exhausted within a few centuries. These must be conserved for more essential services than mere power supply."

The amount of research being conducted upon the problem of atomic power is extraordinarily small compared with the large winnings to mankind if success should be achieved. Most of the research is being undertaken in university and scientific institutional laboratories without any commercial objectives. On account of the extreme importance of adequate power to national economy and military defense, as well as to industry, adequate support of investigations of atomic power would seem to be a highly justifiable gamble.

The Rockefeller Foundation has just demonstrated faith in the possibilities of this research by giving \$1,150,000 toward a new 4,900-ton cyclotron (See *SNL*, April 20).

In connection with the possible obtaining of practical power from uranium, the use of a few tons of the gold stored at Fort Knox, serving no useful industrial or scientific purpose, would be helpful. Such use of the gold would not involve its loss. The most practical methods that have been suggested of concentrating uranium is through ther-

mal diffusion or through centrifuging. The uranium would be in the form of a complex gaseous fluoride which is highly corrosive to ordinary material but which is resisted by gold.

If sufficient gold to construct the necessary apparatus could be loaned by the government to research laboratories, this particular investigation would be very much speeded. The gold after the experiment could be returned to storage and even while in practical use would not lose its value as an asset in the United States Treasury. Perhaps some of the same gold that was prized by the Egyptian pharaohs could be used in this experiment since gold is one of the most imperishable materials on earth.

There has been some fear that the sudden production of a new energy source of large magnitude would be economically disturbing. The experience has been that any development of this sort from a practical standpoint can be introduced only over a period of years even when it is once perfected. The benefits to the community at large from cheaper power would be so large that if and when atomic power or other power of low cost is achieved it would be well worth while to make the necessary economic adjustments.

Science News Letter, May 4, 1940

BIOCHEMISTRY

New Blood Test Depends On Permeability Rates

A NEW test determining whether a given sample of blood came from a man or another animal and if so, which animal species, was announced by Dr. M. H. Jacobs of the University of Pennsylvania to the National Academy of Sciences.

This test can be used only with fresh normal blood. It would be useless with blood stains, Dr. Jacobs explained. The test is based on the striking and apparently constant way in which certain substances penetrate the walls of red blood cells of different species of vertebrates when the acidity or alkalinity of the solution is systematically varied. Glycerol is a useful substance for detecting species difference in this way, but tests with this chemical take rather a long time. The tests can be made much faster, Dr. Jacobs discovered, with ethylene glycol, generally known to the layman as the basis of a popular anti-freeze preparation.

"In the examination of approximately 100 samples of blood distributed among these species (common laboratory animals and man) no case has so far been encountered in which the origin of the blood could not be correctly determined by this test alone," Dr. Jacobs reported.

"Even such closely related species as the albino rat and the albino mouse are readily distinguishable, as are the dog and the cat, the rabbit and the guinea pig, the ox and the sheep, etc."

Science News Letter, May 4, 1940

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GEOPHYSICS

High-Transpiration Plants One Means to Abate Floods

Studies at U. S. Department of Agriculture's
Arlington Farm Yield New Data on Evaporation

TO ABATE floods, encourage vegetation with a high rate of transpiration, or water loss through its leaves, was one recommendation offered before the meeting of the American Geophysical Union in Washington by Dr. C. W. Thornthwaite and Benjamin Holzman of the U. S. Soil Conservation Service.

This recommendation is one of the practical applications of studies now being made of evaporation rates from soil and transpiration rates from plants, by scientists of the Soil Conservation Service. It has hitherto been impossible to obtain anything like a direct measurement of such escape of water into the air, but the new method, now in use for about a year, obtains usable data by measuring two factors (1) the air moisture above the area under examination, (2) the rate at which the turbulent air currents near the ground carry off this moisture.

Winter, in the region around Washington, is a time of soil-moisture storage, the studies showed. Evaporation losses to the air in June were five times as great as in January. Precipitation in winter, however, is nearly as great as in summer and in addition may be stored on the ground in the form of snow.

Science News Letter, May 4, 1940

Trigger for Earthquakes

THERE is a connection between the seasonal distribution of heavy earthquakes and the seasonal shifts in baro-

metric pressures, Prof. Herman Landsberg of Pennsylvania State College told the Geophysical Union. He traced two curves, for the decade 1921-1930, one showing seasonal changes in barometric pressure in Northern and Southern Hemispheres, the other the seasonal variation of heavy quakes. There was a remarkably close fit of peaks and valleys between the two curves.

It has been known for some time that air masses are shifted to the south across the equator in the spring of the Northern Hemisphere, and in the opposite direction in the fall. The changes in loading of the earth's crust by the shift in weight of these "invisible mountains" are sufficient, Dr. Landsberg held, to have a trigger effect on earthquake forces already built up in the rocks and awaiting only a last straw of some kind to set them off.

Science News Letter, May 4, 1940

ANTHROPOLOGY

Death for Girl to See Boy Minus His Hat in Jungle Isle

A SOUTH SEA island tribe which requires its young men to wear basket-shaped hats from the time of puberty until marriage, and forbids girls to see the boys without their hats on pain of death, was reported by Dr. Douglas L. Oliver, Harvard anthropologist, returned from a two-year stay on tropical Bougainville, of the Solomon Islands.



LEST SHE DIE

Dr. Oliver obtained measurements of more than 2,000 native blacks in the jungle interior of Bougainville, anthropologically important as part of the mysterious ethnic "black spot" of Oceanic. The extremely dark peoples of Bougainville and a few nearby islands are surrounded by a people having very different physical characteristics, including lighter skins, and also an entirely different language base.

The largest series of physical measurements ever made in Melanesia, Dr. Oliver's data are expected to go far toward answering the question whether these Negro peoples are the descendants of the original inhabitants of Melanesia, going back thousands of years before the coming of the Austronesians, now found in the coastal districts.

For fifteen months Dr. Oliver and his wife lived in a grass hut in a village of the Siwai in the Bougainville jungle, thirty miles from the coastal mission station. As background for the intensive work here, the Olivers also traveled for four months through the 120-mile-long island, visiting each major division of the population of 50,000.

Near the Siwai villages, in the jungle, Dr. Oliver found stone monoliths, set up by human beings, hundreds, perhaps thousands of years ago, and so ancient that the ritual purpose has long since been forgotten. Natives believe they were set up by demons.

For twenty years, since the beginning of the British mandate, headhunting has been outlawed in Bougainville, and now the natives rely on elaborate sorcery

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ceremonials to accomplish the death of enemies, Dr. Oliver said.

Dr. Oliver obtained many examples of the highest art of the Siwai, the decoration of long spears and arrows with designs woven with fern fibers dyed yellow and red.

Siwai language, extremely complex and difficult, took the anthropologist ten months to learn, aided by young men of the tribe who had learned Pidgin English on coastal plantations.

The Siwai are a farmer tribe, and pigs are an important basis of wealth and exchange, being nurtured with specially cooked food, Dr. Oliver said.

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From Page 276

largest. The perceived size diminishes when the head is kept fixed and only the eyes are elevated. It does not change when the head is tilted back so that the eyes are not moved with respect to the head."

It works out, the scientists said, that, if one could see the moon below the horizon while standing in an erect position, "it would appear about as much smaller, angle for angle, when compared with the horizon moon, as the moon in elevation seems smaller. The general rule is that objects at a great distance appear largest when the eyes are looking straight ahead with respect to the head, irrespective of the position of the observer's head and body."

Science News Letter, May 4, 1940

Eyes' Electricity Changes

THE ELECTRICAL potential of the human eye—a slight but readily detectable difference between the front and back of the eyeball—is less in dim light or darkness than in brighter light, Prof. Walter R. Miles of Yale University reported. He found an appreciable decline in eye potential after a moderately bright light had been turned off and his subjects left for five minutes in nearly total

darkness, with a further drop after another five minutes. When the light was turned back on, the eye potential rapidly rose again to its former level.

This change in eyeball potential may be of great use in future studies of the retina, the light-sensitive lining of the eye, Prof. Miles suggested. Hitherto, the only way to study effects of light changes has depended on reports of the visual sensation given by the subject under examination, which naturally introduced a considerable subjective element, and therefore possible error. By the new method it is now possible to obtain results that are entirely objective, and independent of the personal equation.

Science News Letter, May 4, 1940

May Make Antibodies

THE POSSIBILITY of eventually manufacturing synthetically in the laboratory for injection into ill patients the antibodies that fight disease germs was suggested in a paper by Dr. Linus Pauling of the California Institute of Technology.

On the basis of how simpler molecules are built, Dr. Pauling has worked out a theory of the structure and process of formation of antibodies. From this theory Dr. Pauling predicts that the synthesis of antibodies might be achieved by denaturing serum globulin, from the blood, and then removing the denaturing agent in the presence of an antigen or haptene. An antigen is a substance which can incite the formation of antibody. A haptene when injected can confer specific antigenic powers on proteins with which it combines.

Science News Letter, May 4, 1940

Light on Growth Processes

LARGE and mature plant cells which have been stimulated by injury to divide again throw much light on the processes of cell division, it was indicated in experiments reported by Prof. Edmund W. Sinnott and Dr. Robert Bloch of Columbia University.

Such cells are hundreds of times as large as the cells of ordinary embryonic tissue and the processes of division in them may therefore be observed on a greatly magnified scale. An important feature of this process, and one which has not been recognized before, is that the cytoplasm of the cell is distributed very early in the exact position which will later be occupied by the new wall. This fact is important for an understanding of plant development, for it

indicates that the entire living substance of the cell, and not the nucleus alone, determines the plane of cell division and thus the direction of growth.

Science News Letter, May 4, 1940

Prone Pressure Best

SAVING lives threatened by death from drowning or gas poisoning by the prone pressure method of resuscitation, familiar to Boy Scouts and other first-aiders, is the best or as good as the best method now known or that can ever be invented, Prof. Yandell Henderson, Yale University, declared.

Even when a man is unconscious and breathless, the breathing center in his brain still controls the tone and elasticity of the muscles of his chest, Prof. Henderson presented evidence to show. This tone of the chest muscles determines how much air is drawn into the lungs between compressions. The compressions cause only expirations.

The person giving artificial respiration cannot "by pulling, pushing, or poking the victim in some particular way," get more air into the lungs than the tonic elasticity of the chest draws in. The standard Schafer, or prone pressure method, is the most effective for the compressions. No method can do more.

Normal breathing is mainly controlled

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by the carbon dioxide produced in the body, Prof. Henderson explained.

"The respiratory center in the brain regulates the breathing so that the volume of air with which the lungs are ventilated is almost exactly 20 times the volume of carbon dioxide that the blood brings from the tissues of the body to the lungs," he continued.

"A man walking slowly produces twice as much carbon dioxide as when sitting still, and he breathes twice as much air. When he does enough work to produce three times as much carbon dioxide as at rest, he breathes three times as much air." The same control operates to a large extent even when a man is unconscious and under artificial respiration.

Science News Letter, May 4, 1940

Ambiguity Principle

A STATE of balance, with a resulting ambiguity, was seen as the ruling condition in the universe by Prof. George D. Birkhoff, Harvard University mathematician, who addressed the National Academy of Sciences.

"Nothing happens without a reason," said Prof. Birkhoff. "On this basis we try to understand what goes on. Philosophers and scientists answer the deepest questions in the same way: How are life and matter related? What is the basis of moral law? Why has space three dimensions?"

"The most satisfying ultimate reasons appear to depend on symmetry and the resulting ambiguity. A scales balance with equal arms and equal weights in the two pans must balance just because of the symmetry and ambiguity of the scales. This is the Principle of Sufficient Reason.

"It may be conjectured that underlying reasons are always best expressed in terms of symmetry and ambiguity. The world then appears as natural and inevitable as the laws of geometry. The theory of such symmetry is the mathematical Theory of Groups."

Science News Letter, May 4, 1940

Swastika Evil in Plants

THE SWASTIKA is not only the symbol of malignancy in politics, but also in the living organism."

This dramatic declaration concluded an address before the National Academy of Sciences, by Dr. D. F. Jones, geneticist at the Connecticut Agricultural Experiment Station at New Haven.

Dr. Jones found the perverted Sign of the Crooked Cross in the cells of a

corn plant that had gone wrong. The grains were partly aborted, some of them showing little swellings like malignant tumors. When he made microscopic preparations of cell tissues he found that two of the long chromosomes had become crossed at right angles. Where they crossed there had been a break or bruise and the two had grown together. Their ends had bent over, giving the whole figure a sinister semblance to a swastika.

Of course, it was only a matter of chance that he found chromosomes distorted into a swastika, Dr. Jones explained. The real mischief results from chromosome breaks and fusions, whatever shapes they may assume. There is some evil magic in chromosome chemistry that makes for diseased and misshapen parts and organs when the chromosomes themselves are injured and assume the wrong shapes.

Sometimes the ill effects become manifest at a distance from the place where the chromosome abnormality occurs; for example, when a gland thus made abnormal causes malformation in a part of the body quite remote from itself.

Science News Letter, May 4, 1940

Medals Awarded

AN eminent Swedish geologist, an American zoologist and a well-known public servant were honored by the National Academy of Sciences with medals and awards, at the Academy's annual dinner.

To Dr. A. H. Westergaard, of Stock-

holm, went the Charles Doolittle Walcott medal and honorarium, in recognition of his outstanding researches, through many years, on the fossil fauna of the Cambrian period, 500 million years and more ago.

Dr. Frank Rattray Lillie, emeritus professor of zoology at the University of Chicago and former president of the National Academy of Sciences, was awarded the Agassiz medal, "for his important researches and his wise leadership in marine biology, for his enduring contributions to the sciences of oceanography in the founding and endowing of the Woods Hole Oceanographic Institution, for his modest but effective leadership in causing this country to assume its share in a world-wide program of oceanographic research."

The Academy's Public Welfare medal was given to J. Edgar Hoover, head of the Federal Bureau of Investigation, as an acknowledgment of his applications of the methods of science in the detection of crime and the conviction of criminals.

Science News Letter, May 4, 1940

Boulder City, which had about 6,000 people during the peak of construction on Boulder Dam, now has a permanent population of about 3,500.

Cornell scientists are evolving breeds of chickens in which the sex of baby chicks is shown by color of the down—useful to poultrymen who like to discard cockerels and spend their time and money on the pullets.

Many readers of SCIENCE NEWS LETTER have from time to time inquired about the syndicate side of SCIENCE SERVICE. During the next few weeks we shall try to describe this work by exhibiting advertisements, circulars and other material addressed to editors and publishers of America's daily newspapers. The advertisement on the opposite page was published in the April 20 edition of EDITOR & PUBLISHER, the weekly magazine of the journalistic profession.

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What salary would you pay this amazing reporter?

He turns in five or six stories a day. He insists on tackling only the toughest assignments. He rates ace-high with a large group of men who produce the best news in the world but hate to let it out because they've been misquoted and misrepresented by so many reporters not specially trained to write about their work. He gets from them stories that mean new health for the sick, new profit for business men, new knowledge for those who would learn, new foods for the housewife, new ways of raising healthy babies, new labor-saving devices for those who toil. Each of his stories has fascination for thousands of readers. Here are some he has dug up in the last few days:

Memphis scientists combine sulfanilamide with a World War explosive (dinitrophenol) to prolong lives of guinea pigs with tuberculosis, offering hope of permanent cure. . . . Sulfamethylthiazole dramatically saves five babies desperately ill with staphylococcus throat infections. . . . Germany believed to be aided by P. E. T. N., explosive made without use of glycerine. . . . Oil chemist theorizes that earth may be making petroleum faster than man uses it. . . . Two of America's largest aircraft manufacturers expected to join in supplying Allies with world's fastest bombers. . . .

Iowa surgeon uses prothrombin to clot blood during operations. . . . Apple industry develops new candy to offset loss of export trade. . . . Canadian chemists produce liquid wood by methods similar to those Germany uses for getting gasoline from coal. . . . Mauna Loa, Hawaii's giant volcano, is a very gentle dragon, having killed no one in its more than 25 outbreaks since 1832. . . . Rayon cord tires make 30 times standard tire mileage under severe tests. . . . Eclipsed sun's rim photographed in the light of its invisible infra-red radiation. . . . University of California gets \$1,150,000 for new cyclotron (atom smasher) that will produce energies of more than 100 million volts. . . .

Wisconsin chemists expect early discovery of new vitamin. . . . National Bureau of Standards recommends air conditioning of newspaper press rooms to prevent web breaks. . . . Detroit scientists find new clue to cause of petit mal epilepsy, disease that has baffled doctors throughout history. . . . Curds and whey now used to make beverages, soup, syrup, cheese, candy, fabrics and plastics. . . . Artificial diamonds a prospect for future. . . . Wars in Polynesia were fought by women with hair-pulling a dominant strategy. . . . New Jersey scientist perfects new insecticide from castor bean plant. . . .

Buffalo biologists kill trichinosis parasites with ultra-short radio waves. . . . Premature babies thrive better on half-skimmed milk than whole milk. . . . Ink blots used to select mental patients who can be healed by insulin shock treatment. . . . Kansas City scientists find way to make grass into human food rich in vitamins. . . . New B vitamin cures some cases of pernicious anemia. . . . Dilantin sodium prevents convulsions in many cases of epilepsy. . . . American scientists wage dramatic fight against typhus fever in five Hungarian villages. . . . System of healing wounds with maggots reduced to simpler basis. . . .

U. S. Army streamlines its emergency rations. . . . Frequency modulated radio defeats barrage of man-made lightning. . . . Squinting children taught to see straight. . . . Men and women who hate to be 30, 40 or 50 years old cause errors in census. . . . Three new drugs offer hope for victims of heart disease. . . . Colorado metallurgists develop an alloy as strong as steel and as noiseless as rubber. . . . University of Pennsylvania physicians report sulfathiazole better than sulfapyridine for treatment of pneumonia. . . .

This rare fellow—who works just as hard as the movie brand of reporter drinks—is the personification of the Science Service staff.

Decide what salary you would be willing to pay such a lively, intelligent chap and then ask us what we want for his services. You'll be surprised—and we don't mean outraged. You'll agree that it's only pin money for a service that will stimulate your news pages like a shot of benzedrine.

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•First Glances at New Books

ASTRONOMY

THE PINPOINT PLANETARIUM — Armand N. Spitz—*Holt*, 86 p., \$2. With scissors and paste, the star diagrams in this book can be assembled into guides to the heavens that you can hold in your hands. A pin or needle is used to prick holes in these cut-outs to represent the stars. Good descriptions of the constellations, too.

Science News Letter, May 4, 1940

REFERENCE

SMALL DIRECTORY OF ADDRESSES—Mahala Saville—*Faxon*, 84 p., \$1.25. Compiled by a reference librarian for her own use, this little book will be equally useful for school people and office workers. Binders, book dealers, periodicals (by subject), school equipment—a variety of addresses are given, in a convenient arrangement for desk use.

Science News Letter, May 4, 1940

GEOGRAPHY—EDUCATION

VISUAL AIDS FOR PUPIL ADVENTURE IN THE REALM OF GEOGRAPHY—Seymour West, comp.—*Visual Aids Service, N. J. State Teachers College, Montclair, N. J.*, 22 mimeographed sheets, 50c. Exhibits, charts, films, graphs, maps, pictures and slides available from various sources and useful in elementary, junior high school, senior high school and college teaching.

Science News Letter, May 4, 1940

GEOLOGY

GEOLOGY OF THE CHICAGO REGION, Part I, General—J. Harlen Bretz—*Division of the State Geological Survey, Urbana, Illinois*, 118 p., 50c. (Bulletin No. 65)

Science News Letter, May 4, 1940

ARCHAEOLOGY

STUDIES ON THE ICE AGE IN INDIA AND ASSOCIATED HUMAN CULTURES—H. de Terra and T. T. Paterson—*Carnegie Inst. of Washington*, 354 p., 54 pl., cloth, \$7.50; paper, \$6.50. Monographic treatment of researches on prehistory in what may at last prove to be the cradle of the human race, filling in details of the outlines previously sketched in preliminary reports (see SNL Dec. 17, 1938; Nov. 25, 1939).

Science News Letter, May 4, 1940

ECONOMICS

THE GOOD OLD DAYS—David L. Cohn—*Simon and Schuster*, 597 p., \$3.75. Not only American economics, but American psychology, customs, and scientific progress are featured in this entertaining saga, based on a study of Sears Roebuck

catalogs from 1886 to date. Like the catalogs, it covers an amazing diversity, including—random examples—mail-order tombstones, the rise of Ready-to-Wear, and gardening (how it has changed).

Science News Letter, May 4, 1940

ENGINEERING

GERMAN-ENGLISH GLOSSARY FOR CIVIL ENGINEERING—Alphonse A. Briemaier—*University of Illinois, Engineering Experiment Station*, 37 p., 45c. (Circular Series No. 40.)

Science News Letter, May 4, 1940

AERONAUTICS—ENGINEERING

AIRPLANES AND ELEMENTARY ENGINEERING—Daniel J. Brimm—*International Textbook Co.*, 108 p., \$1.80. A textbook of British origin reviewing the fundamentals of airplane construction.

Science News Letter, May 4, 1940

TECHNOLOGY

THE BACKGROUND AND ECONOMICS OF AMERICAN PAPERMAKING—Louis Tillotson Stevenson—*Harper*, 249 p., \$3. A scholarly and well documented work describing paper making and its economic place in our modern society.

Science News Letter, May 4, 1940

SOCIOLOGY

RURAL ROADS TO SECURITY, America's Third Struggle for Freedom—Luigi G. Ligutti and John C. Rawe—*Bruce (Milwaukee)*, 387 p., \$2.75. Facts and figures about urban-rural dislocations, convincingly presented, are backed up with an emotional appeal that makes the reader want to do something about it. It is not all theoretical discussion, either: the senior author is leader of one of the really successful subsistence homestead projects in this country and can therefore speak as one having authority.

Science News Letter, May 4, 1940

CHEMISTRY

HAIR-DYES AND HAIR-DYEING CHEMISTRY AND TECHNIQUE (Rev. ed.)—H. Stanley Redgrove and Gilbert A. Foan; Rev. by H. Stanley Redgrove and J. Bari-Woolss—*Chemical Pub. Co.*, 205 p., \$5.

Science News Letter, May 4, 1940

MEDICINE

YOUR BABY AND HOW TO CARE FOR IT—Lindsey W. Batten—*Harper*, 182 p., \$1.50. Sensible and clearly written advice for young mothers by a British physician.

Science News Letter, May 4, 1940

BOTANY

MOUNTAINS IN FLOWER — Volkmar Vareschi and Ernst Krause—*Macmillan*, 159 p., \$3. Charming little essays by a botanist who knows and loves the flowers of his Alps, and enjoys the company of mountaineers, fellow-botanists, anyone who shares his enthusiasm and gives thought to the protection of the rare plants. The illustrations are superb; seldom have three-score-and-ten such uniformly excellent flower photographs been gathered into one book.

Science News Letter, May 4, 1940

ZOOLOGY

INTRODUCTION TO VERTEBRATE ZOOLOGY—William Henry Atwood—*Mosby*, 511 p., \$3.75. A carefully worked out, systematic textbook of comparative vertebrate zoology, suitable for use in advanced college classes.

Science News Letter, May 4, 1940

AGRICULTURE

PRACTICAL FARMING FOR BEGINNERS—H. A. Highstone—*Harper*, 199 p., \$2.50. A handbook for the subsistence farmer, giving practical advice about land, implements, crops, management. While it is true that one cannot learn farming from a book, certainly one can learn a great deal from this book.

Science News Letter, May 4, 1940

GENERAL SCIENCE

UNIVERSITY OF COLORADO STUDIES: Series D. Physical and Biological Sciences, Vol. I, No. 1—Francis Ramaley, ed.—*University of Colorado*, 69 p., \$1. First issue of a new series of publications. If the continuation lives up to this initial promise, substantial contributions in several sciences can be looked for from these Studies.

Science News Letter, May 4, 1940

ENTOMOLOGY

FLEAS OF EASTERN UNITED STATES—Irring Fox—*Iowa State College Press*, 191 p., 31 pl., \$3. Of interest primarily to professional entomologists. The text is strictly technical and the plates are all line drawings of critical diagnostic characters. To its intended audience, this monograph will be highly useful.

Science News Letter, May 4, 1940

BOTANY

LIVERWORTS OF SOUTHERN MICHIGAN—William Campbell Steere—*Cranbrook Institute of Science*, 97 p., paper, 50c., cloth, \$1. (See page 280.)

Science News Letter, May 4, 1940